

WHAT IS CLAIMED AS NEW AND IS INTENDED TO BE SECURED BY LETTERS
PATENT IS:

1. A saponified ethylene-vinyl acetate resin, which comprises from 0.1 to 3000 ppm based on the total amount of ethylene-vinyl acetate resin, of a compound having a molecular weight of at most 1000 and having at least one conjugated double bond, an alkoxy group content of from 0.0005 to 1 mol% based on the total moles of monomer units in the resin, an ethylene content of from 5 to 60 mol% based on the total moles of monomer units in the resin, and a degree of saponification of at least 85 mol% based on the number of moles of vinyl acetate monomer units in the resin.

2. The saponified ethylene-vinyl acetate resin of Claim 1, wherein the amount of compound having a molecular weight of at most 1000 is 5 to 1500 ppm.

3. The saponified ethylene-vinyl acetate resin of Claim 1, wherein the compound having a molecular weight of at most 1000 is selected from the group consisting of 1-phenylbutadiene, sorbic acid, 2,4-diphenyl-4-methyl-1-pentene, 1,3-diphenyl-1-butene, 2,3-dimethyl-1,3-butadiene, 4-methyl-1,3-butadiene, 1-phenyl-1,3-butadiene, myrcene and mixtures thereof.

4. The saponified ethylene-vinyl acetate resin of Claim 1, wherein the alkoxy group content is 0.001 to 0.5 mol%.

5. The saponified ethylene-vinyl acetate resin of Claim 1, wherein the alkoxy group has from 1 to 5 carbon atoms.

6. The saponified ethylene-vinyl acetate resin of Claim 1, wherein ethylene content is 20 to 55 mol%.

7. The saponified ethylene-vinyl acetate resin of Claim 1, wherein the degree of saponification is at least 98 mol%.

8. The saponified ethylene-vinyl acetate resin of Claim 1, further comprising 10 to 5000 ppm of a higher fatty acid or derivative thereof, expressed as the ppm of free fatty acid relative to the total amount of ethylene-vinyl acetate resin.

5 9. The saponified ethylene-vinyl acetate resin of Claim 8, wherein the amount of higher fatty acid or derivative thereof is 100 to 1000 ppm.

10. The saponified ethylene-vinyl acetate resin of Claim 8, wherein the higher fatty acid has 8 to 30 carbon atoms.

10 11. The saponified ethylene-vinyl acetate resin of Claim 8, wherein the higher fatty acid or derivative thereof is selected from the group consisting of palmitamides, stearamides, oleamides, linolic amides, linolenic amides, ethylene-bis-stearamide, ethylene-bis-oleamide, sodium stearate, calcium stearate, magnesium linolenate, and mixtures thereof.

12. The saponified ethylene-vinyl acetate resin of Claim 1, further comprising from 10 to 5000 ppm, of a boron compound, expressed as the ppm of elemental boron in said boron compound relative to the total amount of ethylene-vinyl acetate resin.

15 13. The saponified ethylene-vinyl acetate resin of Claim 12, wherein the amount of boron compound is 100 to 1500 ppm.

20 14. The saponified ethylene-vinyl acetate resin of Claim 12, wherein the boron compound is selected from the group consisting of boric acid, orthoboric acid, metaboric acid, tetraboric acid, alkali metal salts of boric acid, alkaline earth metal salts of boric acid, triethyl borate, trimethyl borate, trialkyl borate, borax, boron hydride, and mixtures thereof.

15. A product comprising the saponified ethylene-vinyl acetate resin of Claim 1.

16. A product comprising the saponified ethylene-vinyl acetate resin of Claim 8.

17. A product comprising the saponified ethylene-vinyl acetate resin of Claim 12.

18. The product of Claim 15, wherein the product has a form selected from the group of a monolayer film, a multilayer film, a bag, a pouch, a tube, a thermoformed container, an injection molded bottle, a blow molded bottle, a laminated film, and a parison.

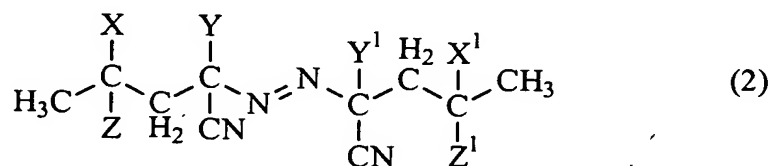
19. A method for producing the saponified ethylene-vinyl acetate resin of claim 1 comprising:

polymerizing a monomer mixture comprising ethylene and vinyl acetate in the presence of a polymerization initiator having an alkoxy group, thereby forming an ethylene-vinyl acetate copolymer;

adding a compound having a molecular weight of at most 1000 and at least one conjugated double bond to the ethylene-vinyl acetate copolymer; then

saponifying the ethylene-vinyl acetate copolymer containing a compound having a molecular weight of at most 1000 and at least one conjugated double bond, thereby forming a saponified ethylene-vinyl acetate copolymer.

20. The method of claim 19, wherein the polymerization initiator having an alkoxy group has a structure according to formula (2):



wherein X, X¹, Y, Y¹ each independently represent an alkyl group having 1 to 5 carbon atoms, and Z and Z¹ each independently represent an alkoxy group having 1 to 5 carbon atoms.

21. The method of claim 20, wherein the polymerization initiator having an alkoxy

group is selected from the group consisting of 2,2'-azobis(4-methoxy-2,4-dimethylvaleronitrile), 2,2'-azobis(4-ethoxy-2,4-diethylvaleronitrile), and 2,2'-azobis(4,4'-diethoxy-2-methylvaleronitrile).

22. The method of Claim 19 further comprising:

5 adding a higher fatty acid or derivative thereof and/or a boron compound to said saponified ethylene-vinyl acetate copolymer

23. A method of extruding a product comprising the saponified ethylene-vinyl acetate resin of Claim 1 comprising:

10 extruding the saponified ethylene-vinyl acetate resin in a single-layer extrusion apparatus or multi-layer coextrusion apparatus.

24. A method of extruding a product comprising the saponified ethylene-vinyl acetate resin of Claim 8 comprising:

extruding the saponified ethylene-vinyl acetate resin in a single-layer extrusion apparatus or multi-layer coextrusion apparatus.

15 25. A method of extruding a product comprising the saponified ethylene-vinyl acetate resin of Claim 12 comprising:

extruding the saponified ethylene-vinyl acetate resin in a single-layer extrusion apparatus or multi-layer coextrusion apparatus.